

CLAIMS

- 1.- A simplified metering pump comprising: (a) a main body (1) having a first
5 surface (11), (b) first means for attachment to a bottle neck, (c) second means for
attachment of a dip tube, (d) an inlet valve (9), (e) a head (5), where said head (5) has a
second surface (13) facing said first surface (11), and where said first surface (11) and
said second surface (13) define a pumping chamber (17), where said head (5) is made
10 from a material having elastomeric properties adapted to be resiliently deformed by a
manually applied force and has an external actuation surface (15) adapted to be
deformed by a user's finger, and (f) a discharge valve (43) at the outlet of said pumping
chamber (17), where said discharge valve (43) comprises a valve seat (45) and a
moving member adapted to move between a first position, corresponding to said closed
15 discharge valve (43) and in which said moving member contacts said valve seat (45),
and a second position, corresponding to said open discharge valve (43), where said
moving member extends from said head (5) forming a partition (41), where said moving
member is integral with said head (5), and where said first surface (11) and said second
surface (13) are adapted to perform a relative movement therebetween causing the
20 pumping of a liquid between said inlet valve (9) and said discharge valve (43), wherein
when said moving member is in said first position, and there is a reduced pressure in
said pumping chamber (17), said reduced pressure then exerts a force pressing said
moving member against said valve seat (45).
- 2.- The pump of claim 1, wherein said partition (41) is a flat surface.
- 25 3.- The pump of claim 1, wherein said partition (41) is a cylindrical surface.
- 4.- The pump of claim 3, wherein said partition (41) is a cylinder surrounding said
second surface (13).

- 5.- The pump of claim 4, wherein said valve seat (45) is formed by a second also cylindrical partition (47) disposed in said main body (1), where said second partition (47) surrounds said first surface (11).
- 5 6.- The pump of any one of claims 1 to 5, wherein said second surface (13) is convexely curved towards the outside of said pumping chamber (17), preferably is a spherical cap.
- 10 7.- The pump of any one of claims 1 to 6, wherein said first surface (11) has a concavely curved portion towards the interior of said pumping chamber (17), preferably is a spherical portion.
- 15 8.- The pump of claim 7, wherein said curved portion and said second surface (13) make contact in the limit of the stroke followed by said second surface (13) during a pumping movement.
- 9.- The pump of claim 7 or claim 8, wherein said curved portion has an external rim (51) that is convex towards the interior of said pumping chamber (17).
- 20 10.- The pump of any one of claims 1 to 9, wherein said valve seat (45) has a rounded contact surface (53) with said moving member.
- 25 11.- The pump of any one of claims 1 to 10, wherein said moving member has a contact portion (55) with said valve seat (45) having a thickness tapering down towards the free end thereof.
- 12.- The pump of any one of claims 1 to 11, having at least one column (57) on said first surface (11) extending towards said second surface (13) and which is disposed at a portion proximate said discharge valve (43).

13.- The pump of claim 12, wherein said columns (57) have a height such as to contact said second surface (13) when said second surface (13) is in the extended position thereof.

5 14.- The pump according to any one of claims 1 to 13, wherein it additionally comprises an attachment body (3) comprising said first attachment means, where said attachment body (3) is attached to said main body (1) with the possibility of a relative displacement between an open position and a closed position and wherein said attachment body (3) comprises a projection which, when said attachment body (3) and
10 said main body (1) are in the closed position, prevents said second surface (13) from performing said relative movement.

15.- The pump of claim 14, wherein said projection is a tubular stem (27) surrounding said inlet valve (9).

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16.- The pump of claim 14 or claim 15, wherein said projection is hermetically sealed against said second surface (13) when said attachment body (3) and said main body (1) are in said closed position.

20 17.- The pump of any one of claims 14 to 16, wherein said relative displacement is greater than said relative movement.

18.- The pump of any one of claims 15 to 17, wherein said main body (1) comprises a first annular lip (31) forming a hermetic seal with the outer wall of said tubular stem
25 (27).

19.- The pump of any one of claims 14 to 18, wherein said main body (1) comprises a second annular lip (37) forming a hermetic seal with an annular partition (35) disposed in said attachment body (3), said annular partition (35) surrounding a
30 ventilation hole (33).